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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/533,014	04/28/2005	Thomas Bosselmann	2002P12570WOUS	1667

28524 7590 07/13/2007
SIEMENS CORPORATION
INTELLECTUAL PROPERTY DEPARTMENT
170 WOOD AVENUE SOUTH
ISELIN, NJ 08830

EXAMINER	
VALONE, THOMAS F	
ART UNIT	**PAPER NUMBER**
2858	
MAIL DATE	**DELIVERY MODE**
07/13/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/533,014	BOSSELMANN ET AL.	
	Examiner	Art Unit	
	Thomas F. Valone	2858	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *12 April 2007*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *21-25 and 27-41* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *21-25 and 27-41* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Objections

1. Claims 28 and 29 are objected to because of the following informalities: Both claims depend upon claim 26 which has been cancelled. This is a repeat of the objection to the claims in the first Office Action. Appropriate correction is required. For examination purposes, claims 28 and 29 are presumed to depend upon claim 21.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

3. Claims 21, 32, 41 and by dependence, 22-25, 27-31, 33-40 are rejected under 35 U.S.C. 112, first paragraph, as based on a disclosure which is not enabling.

A measurement signal in the time domain, rather than the kilohertz frequency domain, for a single rotor blade or guide vane, critical or essential to the practice of the invention, but not included in the claim(s) is not enabled by the disclosure. See *In re Mayhew*, 527 F.2d 1229, 188 USPQ 356 (CCPA 1976). While the background of the invention conveys the critical need for "immediate replacement" of a single blade, "necessary in order to avoid this blade being destroyed and hence the turbine being damaged (disclosure, par. 4), the entire disclosure fails to present an apparatus, system or method for enabling this disclosed requirement. Though the applicant admits that "in the time domain all amplitudes of the frame would be equal" (p. 3, par. 9) under ideal conditions where no wear has occurred, and that the "integrity of the blades can be

obtained in the time domain from the amplitude height" (p. 3, par. 9), the claimed apparatus use and method for determining wear ignores this teaching of the disclosed invention. Instead, the disclosed (par. 24) and claimed measuring element combines individual blade amplitudes into a composite signal in the claimed "kilohertz frequency range" with a disclosed FFT method of analysis and display, where the average amplitude of ALL of the blade and vane signals are combined into one peak at 4800 Hz (p. 12, par. 49-50 and Fig. 7-9). This method necessarily lumps together all of the individual amplitudes, any one of which may easily be below an acceptable level and in a failure mode threatening immediate damage or destruction to the turbine engine. The composite signal however may have 50 to 100 such signals per ring multiplied by four or five rings (estimated from applicant's Fig. 4 and taught by primary reference Harrold (col. 1, line 21) averaged together into one composite 4800 Hz peak slightly above 20 dB of noise, as seen in Figure 8, which may be especially problematic at low power levels, when one blade out of 500 (Harrold, col. 1, line 22) has failed destructively but 499 still are operating with sufficient amplitude. While the applicant convincingly insists that a single blade failure can damage a turbine engine, as cited above, the instant invention fails to disclose or claim a solution to the single blade failure.

It also is clear that the claimed monitoring unit with one measuring element (par. 11) cannot determine which blade or vane has been damaged, until several blades or vanes lose their coating on the surface, since no time domain measurements are monitored. The applicant further admits that the instant invention cannot determine which blade has failed and therefore supports the Examiner's position that single blade

failure cannot be detected though the importance of doing so is made very clear, since the best that is offered in light of the specification is "on which ring" the damage has occurred (par. 51). Furthermore, the single 4800 Hz peak illustrated in Figures 7-9 designates no reference peak at all or "threshold" as claimed, either by response to a location or load condition, since that information cannot be illustrated in the FFT display as shown. Instead, the claimed "defining a threshold" suffers from relative comparison of signals, without which a threshold cannot be determined in any absolute sense. Most disturbing, it can also be argued that while the primary reference Harrold clearly teaches the detection of a *single blade* damage or failure (42a, Fig. 5), the claimed invention represents an inferior, and perhaps falsely reassuring method of averaging ALL of the signals from the blades and vanes into one single representative relative peak and thus may only be useful for detecting catastrophic failure of many or most of the blades and vanes, since a majority of them must display a *lowered amplitude measurement signal* before any composite kilohertz frequency signal will be lowered, as known by those of ordinary mathematical skill in the art of Fast Fourier Transform analysis and the calculation of an average quantity.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. Claims 21, 23-25, 27-32, 34-36 and 41 are rejected under 35 U.S.C. 103(a) as being obvious over Harrold in view of Deegan, both of record.

The applied reference Harrold (6,512,379) has a common assignee with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art only under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 103(a) might be overcome by: (1) a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not an invention "by another"; (2) a showing of a date of invention for the claimed subject matter of the application which corresponds to subject matter disclosed but not claimed in the reference, prior to the effective U.S. filing date of the reference under 37 CFR 1.131; or (3) an oath or declaration under 37 CFR 1.130 stating that the application and reference are currently owned by the same party and that the inventor named in the application is the prior inventor under 35 U.S.C. 104, together with a terminal disclaimer in accordance with 37 CFR 1.321(c). This rejection might also be overcome by showing that the reference is disqualified under 35 U.S.C. 103(c) as prior art in a rejection under 35 U.S.C. 103(a). See MPEP § 706.02(l)(1) and § 706.02(l)(2).

Regarding claims 21 and 41, Harrold includes a plurality of turbine rotor blades and vanes (18, Fig. 2) made of an electrically conducting material (col. 4, lines 34-35) having an electrically insulating surface (col. 4, lines 36-37) and arranged on a rotor shaft (20) that is rotatably mounted in a housing and electrically connected to a reference potential or a plurality of fixed guide vanes (22, Fig. 2) made of an electrically conducting material (col. 4, lines 34-35) having an electrically insulating surface (col. 4,

lines 36-37) with the electrically conducting material of the guide vanes electrically connected to the reference potential (col. 5, lines 32-40), as in claim 21. Harrold also includes a measuring element (28, Fig. 2) operating in a kilohertz frequency range for measuring an electric and/or magnetic field strength set up by a charge distribution on the surface of the rotor blades or guide vanes (col. 6, lines 34-40) resulting from charged particles being deposited on the surface by the same ionized gas as disclosed in the instant invention (par. 9, line 3) flowing over the surface of the rotor blades or guide vanes (col. 4, lines 56-57), as in claims 21 and 41. Harrold also teaches an apparatus for monitoring (col. 3, line 29 and col. 7, line 1-30), also considered a *monitoring unit* (Fig. 3 and col. 5, line 8-15) for determining when the signal deviates from a threshold relative to the other rotor blade signals of the turbo engine (monitoring, col. 3, line 18, 29, 34; col. 4, line 61-64).

For the deviation from a threshold, in light of the specification, the "amplitude height" in the time domain or the frequency domain (instant disclosure, p. 3, par. 9) is the sole measure of quality of the electric field generated by the blade or vane charges and the definable threshold, which is the same teaching of Harrold (Fig. 4 and 5). Harrold also designates the variation of the magnitude of the signal according to the amplitude height or magnitude of the other blades or vanes (col. 3, line 52-58).

For a threshold responsive to a location of the rotor blades or the guide vanes relative to an outlet of the turbo engine, Harrold teaches using pattern-recognition software (col. 6, line 55) and also comparing the signal from one vane to the signals from other vanes, which establishes a threshold (col. 6, line 52-53). Harrold also

designates a load condition in the variation of the magnitude of the signal according to the level of gas pressure (col. 2, line 59), which he also indicates is compressed near the combustor and expands through the turbine (col. 4, line 37-43), that is also relative to the outlet of the turbine engine, as is known to one of ordinary skill in the art.

Harrold further implies a kilohertz frequency range, "the radio frequency signals produced by the coating will likely encompass a broad range of frequencies from below radio frequencies to microwaves and beyond, and any subset of these frequencies may be selected for analysis" (col. 5, line 53-57). Harrold also clearly demonstrates in Fig. 5 a time domain signal that necessarily has to be in the kilohertz range, "as each blade 18 passes the vane 22 adjacent to antenna 28, the antenna 28 will detect the second radio frequency signal from the vane, and the third radio frequency signal 42 from the blade" (col. 6, line 20), which is clearly seen in Fig. 5, implying a frequency matching the rotation speed (kHz).

Harrold does not explicitly teach a kilohertz frequency range or the deviation from a threshold responsive to a load condition or location relative to the outlet of the engine, though the level of signal strength is taught by Harrold above to be responsive to load condition and location relative to the outlet of the engine.

Deegan from the same field of specialty, teaches the kilohertz frequency range (col. 2, line 40) and the determination of a signal deviation by the monitoring unit (Fig. 1A) when a definable threshold value is exceeded (col. 4, lines 12-14). Deegan further teaches the signal defined responsive to load condition (fuel rate, col. 2, line 42).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have included Deegan's teachings of a determination when the kilohertz frequency range signal deviates from a threshold defined responsive to load condition in the invention of Harrold for the benefit of preventing catastrophic failure of the turbine engine when a threshold value is exceeded, as suggested by Deegan (col. 3, line 20).

Regarding claim 32, Harrold teaches a method for determining damage to an electrically insulating surface of a turbine component (col. 6, lines 25-26, 34-37), providing a plurality of turbine blades or vanes made of an electrically conducting material (col. 4, lines 34-35) and arranged within a turbo engine (Figs. 1 and 2); creating an electric and/or magnetic field strength by a charge distribution on the surface of the turbine blade or vane (tribo-charging causing static electricity on blades or vanes, col. 5, lines 37-38); measuring the electric and/or magnetic field strength by a measuring element (col. 5, lines 1-15); and implies determining when the electric field deviates from a definable threshold value (other radio signals, col. 6, line 28). The same argument as above applies to the amended limitations in claim 32 drawn toward kilohertz frequency range measurement.

Harrold does not explicitly teach a kilohertz range or the deviation from a threshold responsive to a load condition or location relative to the outlet of the engine, though the level of signal strength is taught by Harrold above to be responsive to load condition and location relative to the outlet of the engine.

Deegan from the same field of specialty, teaches the determination of a signal deviation by the monitoring unit (Fig. 1A) when a definable threshold value is exceeded (col. 4, lines 12-14). Deegan further teaches the signal defined responsive to load condition (fuel rate, col. 2, line 42).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have included Deegan's teachings of a determination when the kilohertz frequency range signal deviates from a threshold defined responsive to a load condition in the invention of Harrold for the benefit of preventing catastrophic failure of the turbine engine when a threshold value is exceeded, as suggested by Deegan (col. 3, line 20).

Regarding claim 34, at least one of the measuring elements of Harrold are connected to a measuring (col. 5, lines 8-15) and monitoring unit (col. 6, lines 36-7 and Fig. 3) connected to a control center (computer 36, col. 5, line 14).

Regarding claims 23 and 30, Harrold uses an insulating coating (col. 4, lines 36-37) on the electrically conductive blades and vanes, as in claim 30. Harrold's electrically conductive blades and vanes are capable of producing a charge distribution (col. 5, lines 39-40) on the surface of the blades (static electricity within the coating 26), as in claim 23, which is generated by the electrostrictive and piezoelectric insulating properties of the coating.

Regarding claim 24, Harrold uses a coaxial antenna where the axis is a ferrite rod and the outer coaxial layer is nickel (col. 5, lines 2-4).

Regarding claims 25 and 27, at least one of the measuring elements of Harrold are connected to a measuring (col. 5, lines 8-15) and monitoring unit (col. 6, lines 36-7 and Fig. 3) connected to a control center (computer 36, col. 5, line 14).

Regarding claim 28, as best understood, Harrold's measuring, monitoring and control center inherently comprises a signaling device (col. 6, lines 48-53).

Regarding claim 31, Harrold's turbine engine is a gas turbine as well (col. 5, lines 16 and 36).

Regarding claim 29, as best understood, the teachings of Harrold are reviewed above.

Harrold does not include the aspect of an engine shut down by the monitoring unit when a threshold value is exceeded.

Deegan, from the same field of specialty, teaches the shutting down of the turbine engine by the monitoring unit (Fig. 1A) when a definable threshold value is exceeded (col. 4, lines 12-14), as in claim 29.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have included Deegan's teachings of shut down by the monitoring unit in the invention of Harrold, for the benefit of preventing catastrophic failure of the turbine engine when a threshold value is exceeded.

Regarding claims 35, 36, the teachings of Harrold are reviewed above.

Harrold does not include the aspect of an alarm output or engine shut down when a threshold value is exceeded.

Deegan, from the same field of specialty, teaches the shutting down of the turbine engine by the monitoring unit (Fig. 1A) when a definable threshold value is exceeded (col. 4, lines 12-14), as in claim 36, and also the concept of registering an alert (col. 3, line 22), which is inherently an alarm, as in claim 35.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have included Deegan's teachings of shut down and alarm in the invention of Harrold for the benefit of preventing catastrophic failure of the turbine engine when a threshold value is exceeded.

6. Claims 22 and 33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Harrold and Deegan (H-D), further in view of Khorrami (US 5,970,393) of record.

Regarding claims 22 and 33, the teachings of H-D are reviewed above which also includes the concept a separate antenna may be placed in the region of each vane (Harrold, col. 6, line 36).

H-D does not describe the attachment of the measuring element to or on the rotor shaft.

Khorrami teaches the use of a measuring element (microstrip antenna) which can be imbedded and flush mounted or arranged onto high speed machinery, which obviously includes rotating objects (col. 3, lines 11-30) for the monitoring of turbine blades (col. 3, line 60), which satisfies the passive, wireless capability that is implied by the claim's arrangement on a moving object as a rotor shaft, as best understood in light of the specification and #9 in Fig. 5 of the instant application.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have utilized the microstrip antenna of Khorrami in the invention of H-D for a measuring element arranged on high speed machinery, such as a rotor shaft in the region of the vanes, as suggested by Harrold (col. 6, lines 35-36), for the benefit of continuous monitoring of the condition of the vanes with the measuring element that is relatively inexpensive and light weight (Khorrami, col. 3, lines 11-13).

7. Claims 37 - 40 are rejected under 35 U.S.C. 103(a) as being unpatentable over Harrold and Deegan (H-D) further in view of IEEE Interharmonic Task Force of record.

The teachings of H-D are reviewed above. Deegan further teaches the use of a measurement signal processor which performs a spectrum analysis transformation with the product of this analysis passed onto a display device (col. 3, lines 19-20), as in claim 39, and compared to a definable threshold value (predetermined level, col. 4, line 14), as in claim 40.

H-D does not include a signal transformation by a Fourier transform (FFT) where it is displayed and/or signaled and compared with a definable threshold value and does not explicitly address a Fourier transformation (FFT), though it is inherent to spectrum analysis.

The IEEE Interharmonic Task Force, which refers to its work with turbine engines (p. 3, 2nd col., line 21) does include spectrum analysis (Figure 5) and the connection between such analysis and the Fast Fourier Transformation (p. 5, 2nd col., par. 4), as in claims 37 and 38.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have included FFT spectrum analysis, as taught by the IEEE Interharmonic Task Force, of the signal from a measuring element of H-D, for the benefit of preventing catastrophic failure by filtering a specific frequency and setting an alarm when that frequency component exceeds a predetermined threshold value.

Response to Arguments

Applicant's arguments filed 4/12/07 have been fully considered but they are not persuasive. The Examiner thanks the Applicant's representative for pointing out the guidelines for anticipation, especially regarding limitations "expressly or inherently described in a single prior art reference" (Remarks, p. 6). Regarding the Amendments to the Claims filed 4/12/07, no actual amendments to the claims have been made except by adding one more claim. Regarding the arguments concerning claim 21, it is noted that there are no arguments presented for the first three limitations of the claim (plurality of rotor blades..., a measuring element..., arranged near the rotor blades or guide vanes), which implies agreement for the grounds of rejection under 35 USC 102(e). Though the argument alleges that "nothing" in Harrold teaches at least one of two options for monitoring, the last limitation in the claim, it has been repeatedly shown in previous Office Actions that this is not correct. With either option chosen for anticipation of the monitoring unit in claim 21, the use of the apparatus for determining when the signal deviates from a threshold being responsive to a location of the rotor blades or the guide vanes relative to an outlet of the turbo engine or the load condition of the turbo

engine, Harrold inherently anticipates the structure and intended use. Harrold also designates the variation of the magnitude of the signal according to the level of gas pressure (col. 2, line 59), and Deegan in the new grounds of rejection, teaches the load condition fuel rate effect on signal strength (col. 2, line 43), which reads on load condition responsitivity. Further evidence for the performance of the same function as claimed is found in Harrold's use of the apparatus for determining when the signal deviates from a threshold ("lower magnitude than other radio frequency signals", col. 6, line 28 and 42a, Fig. 5), being responsive to a location of the rotor blades or the guide vanes which is relative to an outlet reference ground of the turbo engine for the measured amplitude height, in light of the specification (p. 3, par 9) and "relative to some other part of the turbo engine" as argued. Thus, the definable threshold for either option is found to be taught by Harrold (col. 6, line 15-30) dependent on location and load condition, in view of Deegan, as claimed. Broadly interpreted, the threshold determined by the "comparison among signals" as argued, is the same type of threshold as claimed, since it is responsive to a load condition (all signals will vary due to load condition according to Harrold, col. 2, line 59) in view of Deegan for example. The PTO applies to language of proposed claims broadest reasonable meaning of words in their ordinary usage as they would be understood by one of ordinary skill in art, taking into account whatever enlightenment by way of definitions or otherwise that may be afforded by written description in applicant's specification. *In re Morris* (CA FC) 44 USPQ2d 1023 (9/10/1997).

Regarding the arguments for claim 32, they seem to repeat the same argument about load condition or location relative to the outlet as above but are silent with regard to the four other limitations in the claim. This seems to be the only remaining thread of argument left for claims 32 and 21.Therefore, it may be worthwhile to review how little support or antecedent basis that location or load condition has in the instant disclosure. In light of the specification, "integrity of the blades can be obtained in the time domain from the amplitude height" (p. 3, par. 9), "worn coating on a rotor blade...can therefore generate a *low-amplitude measurement signal*" (p. 4, par. 10), "measures the local electric field and transmits" (p. 10, par. 44), and "deviations from normal value" (p. 7, par. 24) are taught as the method for determining damage and the threshold value. The limitations of load condition or location in the specification seems to be for the FFT method of display, where ALL of the blade and vane signals are combined into one peak at 4800 Hz (p. 12, par. 49-50 and Fig. 7-9). Though the applicant admits that "in the time domain all amplitudes of the frame would be equal" (p. 3, par. 9) under ideal conditions where no wear has occurred, and "integrity of the blades can be obtained in the time domain from the amplitude height" (p. 3, par. 9), the claimed apparatus use and method for determining wear ignores the disclosed invention and therefore, cannot determine which blade or vane has been damaged, as Harrold easily does with time domain measurements. Furthermore, the single 4800 Hz peak illustrated in Figures 7-9 offers no reference peak at all or "threshold" as claimed, either by response to a location or load condition, since that information cannot be illustrated in the FFT display as shown. Instead, the claimed "defining a threshold" suffers from relative comparison of

signals, without which a threshold cannot be determined in any absolute sense. Most disturbing, it can also be argued that while Harrold teaches the detection of a *single blade* damage or failure (42a, Fig. 5), the claimed invention cannot detect a single blade failure that will admittedly cause damage the turbo engine and therefore, represents an inferior and bulk method of averaging ALL of the signals from the blades and vanes into one single representative relative peak and thus may only be useful for detecting catastrophic failure of most of the blades and vanes, since a significant number of the hundreds of blades will need to display a *lowered amplitude measurement signal* before any composite average FFT signal will be lowered, as known by those of ordinary mathematical skill in the art of Fast Fourier Transform analysis and calculation of an average quantity.

Conclusion

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thomas F. Valone whose telephone number is 571-272-8896. The examiner can normally be reached on 10-6:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Andrew Hirshfeld can be reached on 571-272-2168. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Thomas Valone, PhD, PE
Patent Examiner
Art Unit 2858
571-272-8896

Walter Benson
WALTER BENSON, PHD, P.E.
PRIMARY EXAMINER